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A Cross Sectional Study On Prevalence Of Thyroid Follicular Nodular Disease Among Patients In Tertiary Care Hospital

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Abstract

Background: Thyroid follicular nodular disease previously reffered to as goiter is characterized by enlargement of thyroid gland with formation of nodules. FNAC is a safe and fairly accurate method in diagnosis and management of thyroid follicular nodular disease but histopathology is considered as gold standard

Aim: To study prevalence of thyroid follicular nodular disease in teriatry care hospital and to evaluate the diagnostic accuracy between FNAC and histopathology

Materials And Methods: A descriptive cross sectional study done in department of Pathology at our institute for period of one year, sample size of 121 patients with purposive sampling technique.

RESULTS: FNAC done in 121 patients, maximum number of cases were found in the age group 31to 40 years, and females were 83% and males were 17%.

Majority of cases reported on FNAC are thyroid follicular nodular disease. Out of 121 cases histopathological examination correlated in 76 cases. 33 cases were reported as thyroid follicular nodular disease

Conclusion:

Females are most commonly affected by thyroid disease compared to males. FNAC is sensitive , specific and accurate initial diagnostic test for evaluation of thyroid follicular nodular disease but histopathology is considered as gold standard.

Keywords: FNAC, Histopathology, Thyroid follicular nodular disease

Introduction

Thyroid gland diseases are one of the most common endocrine disorders in India as well as in the World. They may be: 1) Diffuse or nodular 2) Benign or malignant 3) Euthyroid or hyperthyroid in status.(1)

Thyroid follicular nodular disease, previously called as Goiter. Thyroid follicular nodular disease is characterized by increase in volume of thyroid gland with formation of nodules, Goiter is most common manifestation of thyroid Disease. (2)

Etiopathogenesis of thyroid follicular nodular disease is not clear. Deficiency of iodine, impairment of hormone synthesis, presence of thyroid stimulating immunoglobins are considered as etiological factors.(3)

Fine needle aspiration cytology (FNAC) is safe procedure in the diagnosis and management of thyroid follicular nodular disease, but Histopathology is considered gold standard. Thyroid nodules are common and usually benign, the risk of malignancy varying from 5 to 10%. (4)

Aim Of The Study

1) To study prevalence of thyroid follicular nodular disease in tertiary care hospital.
2) To evaluate the diagnostic accuracy fine needle aspiration cytology between and Histopathology.

Materials And Methods

Study Design : Descriptive cross - sectional study.

Study Setting : The present study was conducted in the Department of Pathology at our institute.

Study Period: 1 year (June 2022 to May 2023).

Sample Size: 121 patients with thyroid swelling.

Sampling Technique: Purposive sampling.

Inclusion Criteria: All thyroid cases for which FNAC done.

Exclusion Criteria : FNAC with inadequate material.

Study Variables*:* Personal details and clinical history like age, gender, thyroid status, chief complaints etc were recorded. Physical examination and local examination done. Investigations like ultra sound, thyroid functional tests were performed after informed consent and histopatholgical findings were reviewed.

Methods:

Fine needle aspiration cytology: Thyroid swellings were aspirated using 22/23 gauge disposable needles

Smears were made for each case and immediately fixed in isopropyl alcohol, stained with Haematoxylin and Eosin(H&E). Dried smears were stained with Leishman's stain.

Total number of cases for which FNAC done were 121.

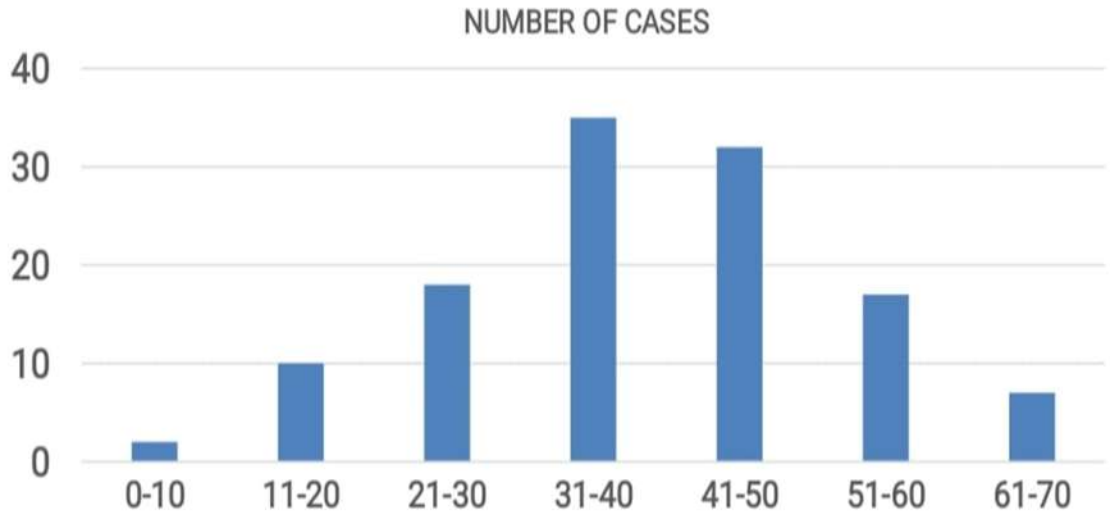
Histopathological examination: Total number of cases for which HPE done were 76, tissue sections were taken and processed and stained with H&E and screened under microscope. Results were noted based on FNAC and Histopathology reports for prevalence.

Comparison between FNAC and Histopathology diagnosis made in 76 cases.

Results

Majority of patients in present study were in age group of 31 to 40, followed by 41 to 50 years, less number of pateinets were in age group of 0 to 10 years. Youngest patient was 6 years and oldest patient was 68 years.

Table 1: Age wise distribution in FNAC cases



Among 121 patients in whom FNAC was done 83% are females and 17% are male.

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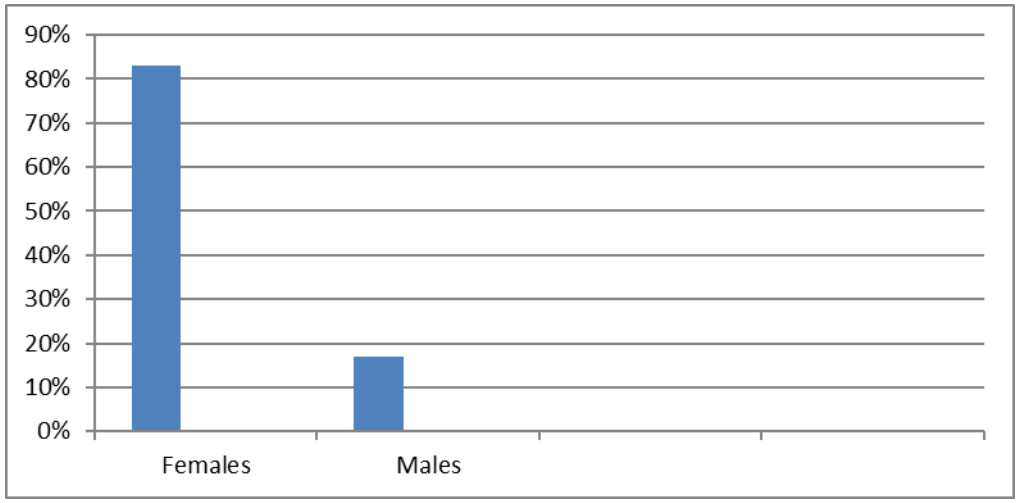
Table 2 : Gender wise distribution of cases



Out of 121 cases for which FNAC done 81 were reported as thyroid follicular nodular disease, 12 are reported as thyroiditis, 3 cases are colloid nodule and 1 case as colloid cyst. 20 cases are reported as papillary carcinoma thyroid and 4 cases as follicular neoplasm.

Table 3: FNAC Diagnosis – Case wise distribution

FNAC FINDING	NUMBER OF CASES	PERCENTAGE
NON NEOPLASTIC/BENIGN		
Thyroid follicular nodular disease	**81**	**66.9%**
Thyroiditis	**12**	**9.9%**
Colloid nodule	**3**	**2.5%**
Colloid cyst	**1**	**0.8%**
NEOPLASTIC		
Follicular neoplasm	**4**	**3.4%**
Papillary carcinoma	**20**	**16.5%**

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Table 4: Histopathological Diagnosis

HPE DIAGNOSIS	NUMBEROFCASES	PERCENTAGE
NON NEOPLASTIC/ BENIGN		
GOITER	33	43.3%
COLLOID CYST	2	2.6%
HASHIMOTO'STHYROIDITIS	2	2.6%
NEOPLASTIC		
FOLLICULAR ADENOMA	8	10.5%
ONCOCYTOMA	4	5.2%
ONCOCYTOMA WITH THYROID FOLLICULAR NODULAR DISEASE	3	3.9%
PAPILLARY CARCINOMA	14	18.4%
PAPILLARY CARCINOMA WITH HASHIMOTOS	6	8.3%
PAPILLARY MICROCARCINOMA WITH FOLLICULAR ADENOMA	2	2.6%
PAPILLARY CARCINOMA WITH THYRIOD FOLLICUALR NODULAR DISEASE	2	2.6%
TOTAL	76	100%

Statistics:

Prevalence :

Prevalence is total number of existing cases (old + new) in defined population at specified period.[5]

Prevalence of thyroid follicular nodular disease on FNAC = 66.94%

Prevalence of thyroid follicular nodular disease on histopathology = 78.94%

Comparison Of Fnac And Histopathology

Among 76 cases in which FNAC and histopathological correlation done.

40 cases are reported as thyroid follicular nodular disease in both FNAC and HPE.

20 cases are reported as thyroid follicular nodular disease in FNAC but not in HPE.

16 cases were not reported as thyroid follicular nodular disease in both FNAC in HPE.

They were no cases reported as thyroid follicular nodular disease in FNAC and reported as thyroid follicular nodular disease in HPE.

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1) **Sensitivity of FNAC : 100%**
2) **Specificity of FNAC : 44.44%**
3) **Positive Predictive value : 66.66%**
4) **Negative Predictive value : 100%**

TABLE 5: AGE WISE CORRELATION WITH OTHER STUDIES

Present study	Athavale VS *et al*	Sanjeeva K *et al*
28.9%	32%	59%

Females were 83%in present study this findindg is consistent with Athavale VS *et al* [3] *(88%) and* Sanjeeva K *et al* [4] *(90%)*

TABLE 6: GENDER WISE CORRELATION WITH OTHER STUDIES

Present study	Athavale VS*et al*	Sanjeeva K*et al*
83% Females	88% Females	90% Females

In FNAC 66.9% cases were thyroid follicular nodular disease which is in correlation with Athvale et al[3] and Amudhan J[11] et al study showing 89% and 64% respectively.

TABLE 7: FNAC REPORT WISE CORRELATION WITH OTHER STUDIES

Present study	Athavale*et al*	AmudhanJ *et al*
66.9%	89%	64%

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Figure 1 : Benign thyroid follicular cells in clusters and follicular patterns.

Background shows scant to moderate colloid. Thyroid follicular nodular disease in FNAC (H&E. 400X)

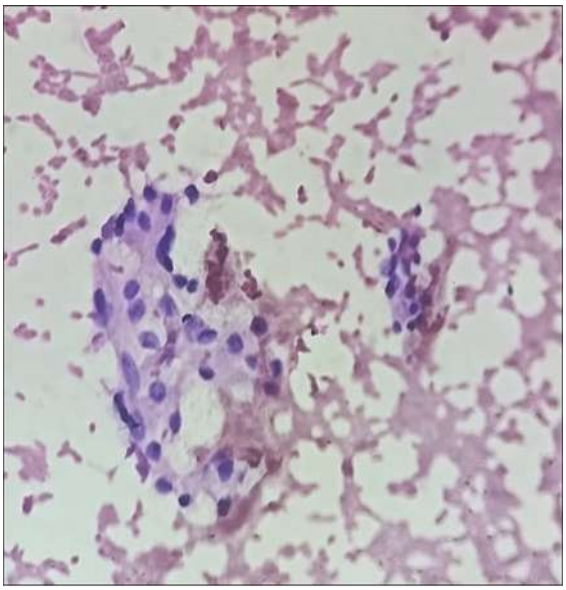

Figure 2 :Thyroid follicular cells along with plenty of cyst macrophages. Colloid cyst in FNAC (H&E. 400X)

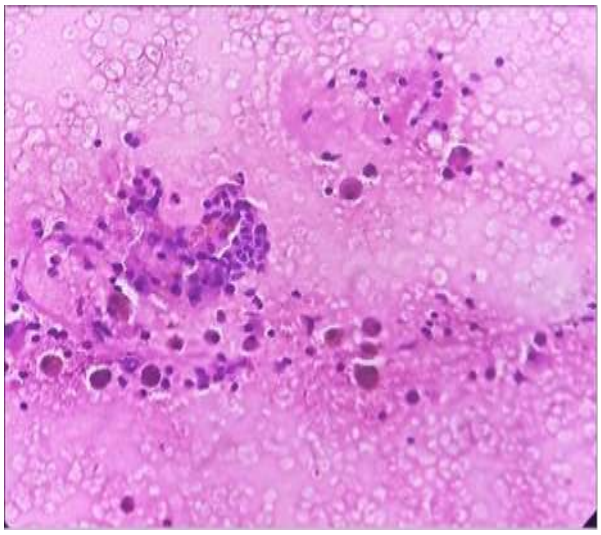

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Figure 3: Thyroid follicles of varying sizes filled with colloid HPE (H&E.100X)

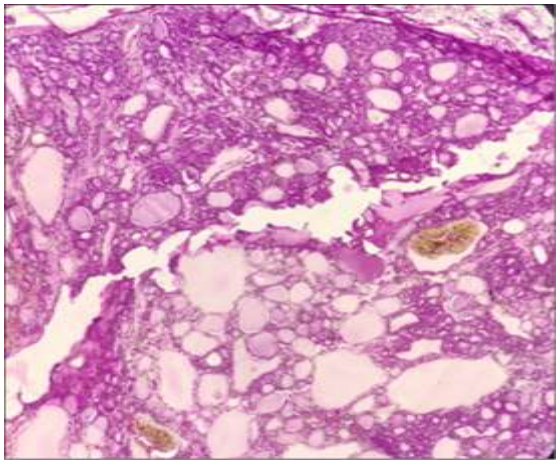

Figure 4: HPE Capsulated tumor with cells arranged in microfollicular pattern (H&E. 100X)

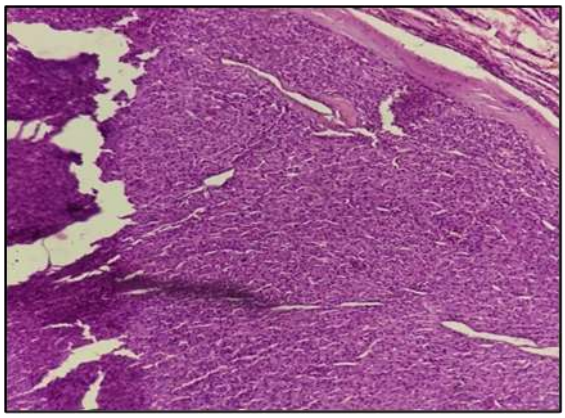

Figure 5: Tumor cells with abundant granular eosinophilic cytoplasm (H&E 400X) HPE Oncocytoma

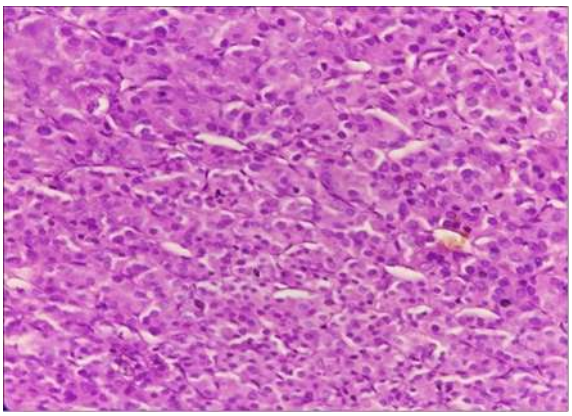

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FIGURE 6: Tumor cells arranged in branching papillae with fibro vascular core (H&E.100X)

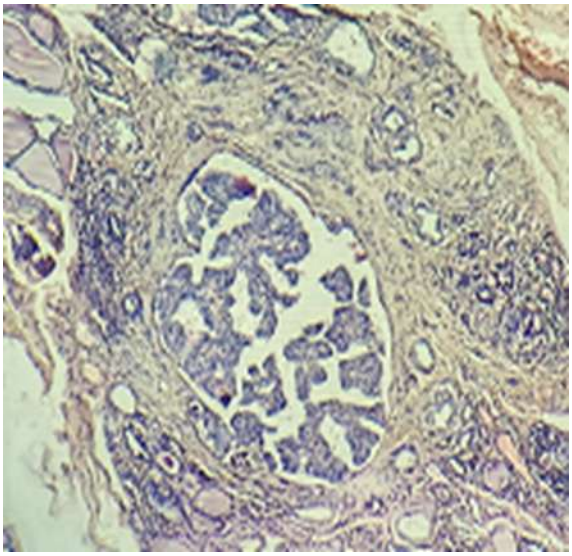

FIGURE 7: Cells with orphan annie eye appearance and nuclear grooving (H&E.400X)

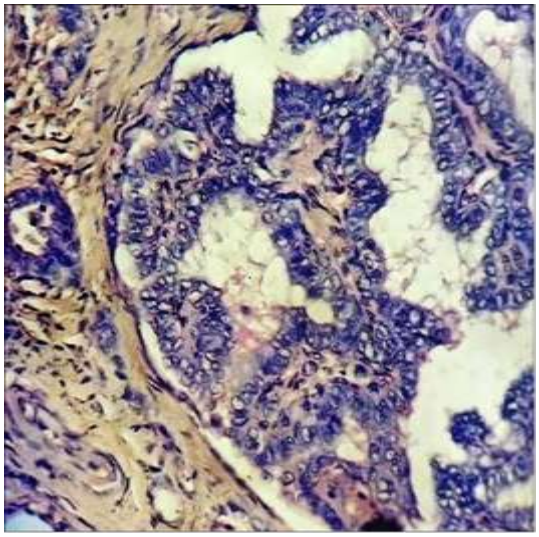

TABLE 8. CYTO - HISTOPATHOLOGICAL CORRELATION WITH OTHER STUDIES

	Sensitivity	Specificity	PPV	NPV	Diagnostic accuracy
Present study	**100%**	**44.44%**	**66.66%**	**100%**	**73.68%**

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Athavale VS *et al*[3]	**100%**	**93.33%**	**71.4%**	**100%**	**94.29%**
E.A Sinna *et al*[6]	**92.8%**	**94.2%**	**94.9%**	**91.8%**	**93.6%**
Arup Senugupta *et al*[7]	**90%**	**100%**	**100%**	**98.75%**	**98.88%**
Padmawar MR *et al* [8]	**100%**	**71.42%**	**71.42%**	**100%**	**94.29%**

Discussion

Majority of cases with thyroid follicular nodular disease were in the age group Of 31to 40 years. Similar study findings were found in study done by Athavale VS et al (3)(32%) and Sanjeeva K et al(4) (59%)

Specificity in this study is low because of : Coexistence of benign and malignant lesions, Cytomorphologic overlap between benign and low grade malignant tumors and sampling error. Histopathological examination were not done in all cases in which FNAC done.

Conclusion:

Thyroid follicular nodular disease is most common in females and majority of cases belongs to age group 31 to 40 years.

FNAC is sensitive, specific and accurate initial diagnostic test for evaluation of patients with thyroid follicular nodular disease, Multiple passes has to be done in FNAC and from different areas, In cystic lesions after draining fluid, aspiration has to be done from residual swelling US Guided FNAC has to be done when ever needed.

Histopathology is gold standard.

Limitations Of Study: Sample size is small, Histopathological examination was not done in all cases of FNAC.

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